

[Print This Page](#)[Close This Window](#)

Team Control Number

41224

For office use only

T1 _____

T2 _____

T3 _____

T4 _____

For office use only

F1 _____

F2 _____

F3 _____

F4 _____

Problem Chosen

A

2015 Mathematical Contest in Modeling (MCM) Summary Sheet

(Attach a copy of this page to your solution paper.)

Type a summary of your results on this page. Do not include the name of your school, advisor, or team members on this page.

text

[TITLE]

1 Introduction

2 Formal Prolegomena

First, some notational definitions. We have tabulated them below.

- (\mathcal{U}) The set of universities and colleges in question.
- (\mathcal{D}) The space of donations – this might have multiple dimensions over \mathbb{R} , depending on the specific categories of money we’re interested in.
- (\mathcal{T}) The space of times for which we have data. We will also be interested in a “sliding window” of times trailing a given time; if $t \in \mathcal{T}$, we’ll denote this window as $\mathcal{W}_n(t)$, where n is the size of the window.
- (\mathcal{V}) The vector space of student metric variables $\{v_i\}$. Note that at this point, we have not yet committed ourselves to any such choice of variables, and so \mathcal{V} includes also negative and neutral indicators of success.

With this framework, we can now formulate the problem more precisely. To do any kind of induction at all, it is necessary to make some commonplace but sometimes very wrong independence assumptions (see Hume). Here’s ours: we will assume that the effectiveness with which an institution can use money does not change over time¹. We can represent this as the function

$$F : \mathcal{D} \times \mathcal{W}_n \rightarrow \mathcal{V} \tag{1}$$

that

3 Hello

Other things

¹This is a reasonable assumption to make; while technically invalid, it seems very natural to judge an institution by its past performance – indeed, this is the best we can hope for from a dataset